

## 2022 年普通高等学校招生全国统一考试

选择题

1. 2022 年普通高等学校招生全国统一考试  $a=2^{-\frac{1}{2}}$ ,  $b=\log_4 20$ ,  $c=\log_3 12$ , 则  $a, b, c$  的大小关系为

- A.  $b < c < a$       B.  $a < c < b$       C.  $b < a < c$       D.  $a < b < c$

答案 D

解析

解析

因为  $a=2^{-\frac{1}{2}}=\frac{\sqrt{2}}{2} \in (0,1)$ ,  $b=\log_4 20=1+\log_4 5 > 1$ ,  $c=\log_3 12=1+\log_3 4 > 1$ ,

所以

$$a=2^{-\frac{1}{2}}=\frac{\sqrt{2}}{2} \in (0,1), b=\log_4 20=1+\log_4 5 > 1, c=\log_3 12=1+\log_3 4 > 1,$$

$\therefore a < b, a < c$

$$\frac{5}{4} = \log_4 4^{\frac{5}{4}} > \log_4 5, \frac{5}{4} = \log_3 3^{\frac{5}{4}} < \log_3 4$$

$$\log_4 5 < \frac{5}{4} < \log_3 4$$

$\therefore b < c$ .

所以  $a < b < c$

答案 D

2. 2022 年普通高等学校招生全国统一考试  $P$  为  $\triangle ABC$  内一点, 且  $4PA = AB \cdot AC$ ,  $\angle ABC = 60^\circ$ , 则  $P$  到  $BC$  的距离为

- A.  $18\sqrt{3}$       B.  $54\sqrt{3}$       C.  $24\pi$       D.  $\frac{16\sqrt{3}+24}{3}$

答案 A

解析

解析

设  $\triangle ABC$  的外接圆半径为  $r$ , 则  $\triangle ABC$  的面积  $P$  到  $BC$  的距离  $h = R + d$

$$\square\square\square\square\square \triangle ABC \square\square\square\square\square r = \frac{AC}{2\sin \angle ABC} = 2\sqrt{3} \square$$

$$AC^2 = AB^2 + BC^2 - 2AB \cdot BC \cdot \cos \angle ABC$$

$$36 = AB^2 + BC^2 - AB \cdot BC \geq 2AB \cdot BC - AB \cdot BC = AB \cdot BC$$

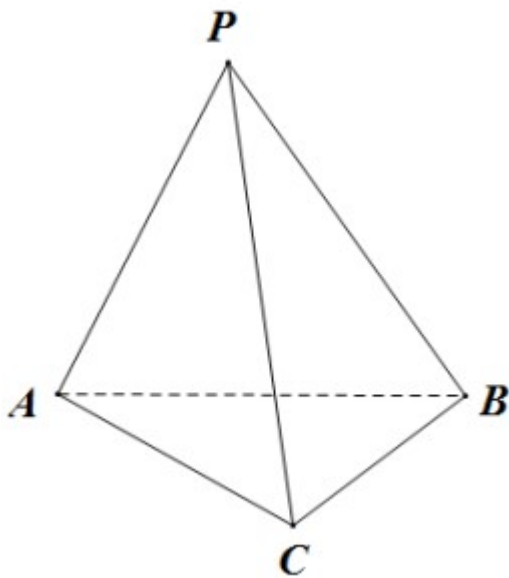
$$\square\square\square\square\square AB=BC\square\square\square\square\square$$

$$S_{\triangle ABC} = \frac{1}{2} AB \cdot BC \cdot \sin \angle ABC \leq \frac{1}{2} \times 36 \times \frac{\sqrt{3}}{2} = 9\sqrt{3}$$

ABC   $d = \sqrt{4^2 - (2\sqrt{3})^2} = 2$

□□□  $P$  □□□  $ABC$  □□□□□□□□  $h=4+ d=4+2$  □

□□□□  $P-ABC$  □□□□□□  $\frac{1}{3} \times 9\sqrt{3} \times 6 = 18\sqrt{3}$ .



3 2022. .

[illegible]

$$A \cap f(x) \subseteq \emptyset \subseteq 3$$

$$B_{\Pi} \approx f(x)$$

C  $f(x)$  在  $(\pi, 0)$  上

D  $f(x)$  在  $\left(0, \frac{\pi}{2}\right)$  上

选项 C

选项

选项

选项

选项

$y = \sin x$  在  $x = 2k\pi + \frac{\pi}{2}, k \in \mathbb{Z}$  上  $y = \sin 2x$  在  $x = k\pi + \frac{\pi}{4}, k \in \mathbb{Z}$  上  $y = \sin 3x$  在  $x = k\pi + \frac{\pi}{3}, k \in \mathbb{Z}$  上

$x = \frac{2k\pi}{3} + \frac{\pi}{6}, k \in \mathbb{Z}$  上  $y = \sin x + \sin 2x + \sin 3x < 3$  A 选项

$f(x + \pi) = \sin(x + \pi) + \sin(2x + 2\pi) + \sin(3x + 3\pi) = -\sin x + \sin 2x - \sin 3x = f(x)$  在  $x = \pi$  处  $f(x)$  取得极大值 B 选项

$f(2\pi - x) = \sin(2\pi - x) + \sin(4\pi - 2x) + \sin(6\pi - 3x) = -\sin x - \sin 2x - \sin 3x = -f(x)$  选项

$f(x)$  在  $(\pi, 0)$  上 C 选项

选项

$f\left(\frac{\pi}{2}\right) = \sin\frac{\pi}{2} + \sin\pi + \sin\frac{3\pi}{2} = 0$   $f\left(\frac{\pi}{6}\right) = \sin\frac{\pi}{6} + \sin\frac{\pi}{3} + \sin\frac{\pi}{2} = \frac{3 + \sqrt{3}}{2} > \left(\frac{\pi}{2}\right)$   $f(x)$  在  $\left(0, \frac{\pi}{2}\right)$  上 D 选项

选项

选项 C

4 2022 年 选项  $2^a = \sqrt{3}, 5^b = 2\sqrt{2}, c = \frac{4}{5}$  选项  $a, b, c$  选项

A  $a > b > c$

B  $c > b > a$

C  $c > a > b$

D  $a > c > b$

选项 C

选项

选项

选项  $a = \log_2 \sqrt{3} = \frac{1}{4} \log_2 3^2 > \frac{3}{4}$   $b = \log_5 2\sqrt{2} = \frac{1}{4} \log_5 64 < \frac{3}{4}$   $(\sqrt{3})^{10} < 2^8$  选项

选项



$$\because 2^a = \sqrt{3}, 5^b = 2\sqrt{2}$$

$$\therefore a = \log_2 \sqrt{3} = \frac{1}{2} \log_2 3 = \frac{1}{4} \log_2 3^2 > \frac{1}{4} \log_2 8 = \frac{3}{4}$$

$$b = \log_5 2\sqrt{2} = \frac{1}{4} \log_5 64 < \frac{1}{4} \log_5 125 = \frac{3}{4}$$

$$\therefore a > b$$

$$(\sqrt{3})^{10} = 243 < 2^8 = 256$$

$$\therefore \sqrt{3} < 2^{\frac{4}{5}} \quad a = \log_2 \sqrt{3} < \log_2 2^{\frac{4}{5}} = \frac{4}{5} = c,$$

$$c > a > b.$$

C.

$$5 \times 2022 \cdot \dots R \quad f(x) \quad f(2-x) = f(x) \quad 0 \leq x \leq 1 \quad f(x) = 3^x + a$$

$$f(2021) + f(2022) = \dots$$

$$A \quad -4$$

$$B \quad -2$$

$$C \quad 2$$

$$D \quad 4$$

C

$$f(x) \quad 4 \quad a = -1 \quad f(2021) + f(2022) = f(1) + f(2)$$

$$\therefore R \quad f(x) \quad f(2-x) = f(x)$$

$$\therefore f(2+x) = f(-x) = -f(x)$$

$$\therefore f(4+x) = -f(x+2) = f(x) \quad 4$$

$$0 \leq x \leq 1 \quad f(x) = 3^x + a \quad f(0) = 0$$

$$\therefore f(0) = 3^0 + a = 0 \quad a = -1$$





$$\frac{2\sqrt{6}a}{3}$$

$$r = \frac{\frac{\sqrt{6}a}{3}}{\frac{\sqrt{3}}{2}} = \frac{2\sqrt{2}a}{3}$$

$$h = \sqrt{\left(\frac{2\sqrt{6}a}{3}\right)^2 - \left(\frac{2\sqrt{2}a}{3}\right)^2} = \frac{4a}{3}$$

$$\frac{1}{3} \times \frac{\sqrt{3}}{4} \times \left(\frac{2\sqrt{6}a}{3}\right)^2 \times \frac{4a}{3} = \frac{8\sqrt{3}a^3}{7}$$

A

7. 2022· 已知三棱锥  $ABC-A_1B_1C_1$  中，

$AB \perp AC$ ， $AA_1 = 2BC$ ，三棱锥  $ABC-A_1B_1C_1$  的体积为  $40\pi$ ，则三棱锥  $ABC-A_1B_1C_1$  的外接球的表面积为

A  $4\sqrt{2}$       B  $8\sqrt{2}$       C  $16\sqrt{2}$       D  $32\sqrt{2}$

B

已知三棱锥  $ABC-A_1B_1C_1$  中， $BCC_1B_1$  为矩形，

若  $BC = 2a$ ， $AA_1 = 4a$ ，则三棱锥  $ABC-A_1B_1C_1$  的外接球的表面积为

三棱锥  $ABC-A_1B_1C_1$  的外接球的半径  $R = \sqrt{\left(\frac{AA_1}{2}\right)^2 + \left(\frac{BC}{2}\right)^2} = 5a$

$4\pi \times 5a^2 = 40\pi$ ，解得  $a = \sqrt{2}$ ， $AA_1 = 2BC = 4\sqrt{2}$

设  $AB = x$ ， $AC = y$

$$\begin{cases} x^2 + y^2 = 8 \\ xy \leq 4 \end{cases} \quad x = y = 2$$

$$V = S_{\triangle ABC} \cdot AA_1 = \frac{1}{2} xy \cdot AA_1 = 2\sqrt{2} xy \leq 8\sqrt{2}$$

B

$$f(x) = \sin\left(2x - \frac{\pi}{3}\right) \quad g(x) = 2\cos\left(2x - \frac{\pi}{4}\right) \quad [a, b] \quad b - a$$

□

$$A \quad \frac{5\pi}{24}$$

$$B \quad \frac{7\pi}{24}$$

$$C \quad \frac{\pi}{4}$$

$$D \quad \frac{23\pi}{48}$$

A

□

□

$$f(x) \quad g(x) \quad [a, b]$$

□

$$2k\pi - \frac{\pi}{2} \leq x - \frac{\pi}{3} \leq 2k\pi + \frac{\pi}{2} \quad (k \in \mathbb{Z}) \quad k\pi - \frac{\pi}{12} \leq x \leq k\pi + \frac{5\pi}{12} \quad (k \in \mathbb{Z})$$

$$f(x) \quad \left[k\pi - \frac{\pi}{12}, k\pi + \frac{5\pi}{12}\right] \quad (k \in \mathbb{Z})$$

$$2k\pi - \pi \leq x - \frac{\pi}{4} \leq 2k\pi \quad (k \in \mathbb{Z}) \quad k\pi - \frac{3\pi}{8} \leq x \leq k\pi + \frac{\pi}{8} \quad (k \in \mathbb{Z})$$

$$g(x) \quad \left[k\pi - \frac{3\pi}{8}, k\pi + \frac{\pi}{8}\right] \quad (k \in \mathbb{Z})$$

$$[a, b] \subseteq \left[k\pi - \frac{\pi}{12}, k\pi + \frac{\pi}{8}\right] \quad (k \in \mathbb{Z}) \quad b - a \leq \frac{\pi}{8} + \frac{\pi}{12} = \frac{5\pi}{24}$$

A

$$C: y^2 = 2px \quad (p > 0) \quad F \quad A \in B \quad C \quad AF \perp BF \quad AB$$

$$d = \frac{|AB|}{d}$$



$$A \square \frac{3\sqrt{2}}{2}$$

$B \approx \sqrt{3}$

$$C \approx \frac{\sqrt{2}}{2}$$

$D \approx \sqrt{2}$

□□□□D

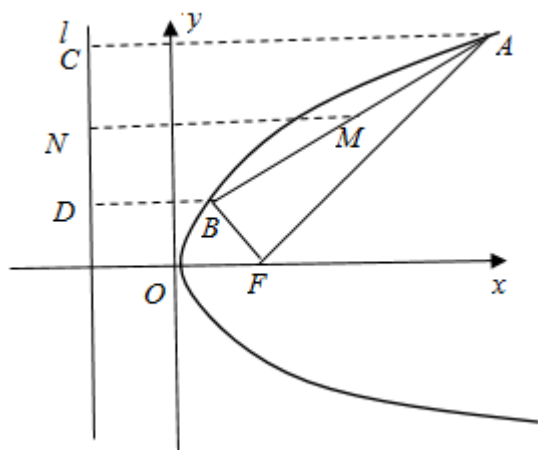
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$|AF|, |BF|$  之间的距离为  $d$  时,  $\frac{|AB|}{d}$  为定值.

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$AB$   $M$ ,  $I$   $C$   $D$   $N$



$$\boxed{\quad} |AF|=a, |BF|=b \quad \boxed{\quad} \boxed{\quad} |AC|=a \quad |BD|=b \quad \boxed{\quad}$$

$MN \parallel ACDB \implies d = |MN| = \frac{a+b}{2}$  □

$$\boxed{AF \perp BF} \quad |AB| = \sqrt{a^2 + b^2} \quad \boxed{\phantom{00}}$$

$$\frac{|AB|}{d} = \frac{2\sqrt{a^2 + b^2}}{a + b}$$

$$a^2 + b^2 \geq \frac{(a+b)^2}{2} \quad \text{if } a=b$$

$$\frac{|AB|}{d} = \frac{2\sqrt{a^2 + b^2}}{a + b} \geq \frac{\sqrt{2}(a + b)}{a + b} = \sqrt{2}$$

□□□D.



10002022.0000.00000000  $P$ 0000 4 00000  $ABC$ 000000000  $AP = \lambda AB + (2 - 2\lambda)AC (\lambda \in \mathbf{R})$ 00  $PA \cdot PC$ 0

□ □ □ □ □      □

A□16

B12

C□5

D□4

□□□□C

1111

11

☐  $AC$  ☐  $D$  ☐  $AD=2AC$  ☐  $P$  ☐  $BD$  ☐  $PA \cdot PC = |PO|^2 - 4$  ☐  $|PO|$  ☐.

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$AC$   $AD=2AC$

$$AP = \lambda AB + (2 - 2\lambda)AC = \lambda AB + (1 - \lambda)AD + \lambda BD$$

□□□  $AC$  □□□  $O$  □□□  $OP$  □

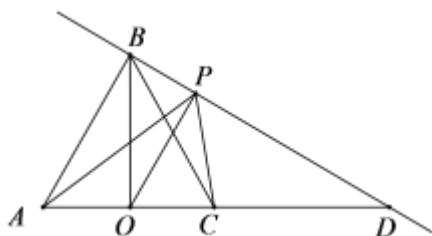
$$PA \cdot PC = (PO + OA) \cdot (PO - OA) = PO^2 - OA^2 = PO^2 - 4$$

$$\square\square\square OP \perp BD \square\square |PO| \square\square\square\square\square\square\square$$

$$\square \square BO=2\sqrt{3}, OD=6 \square \square BD=4\sqrt{3} \square \square |PO|_{\min}=\frac{2\sqrt{3}\times 6}{4\sqrt{3}}=3 \square$$

$$\boxed{\phantom{00}}\boxed{\phantom{00}}PA \cdot PC \boxed{\phantom{00}}\boxed{\phantom{00}}\boxed{\phantom{00}}\boxed{\phantom{00}}\boxed{\phantom{00}}3^2 - 4 = 5 \boxed{\phantom{00}}$$

□□□С.


$$f(x) = \left( 4\cos^2 \frac{x}{2} - 2 \right) \sin x + \cos 2x + 2$$

已知  $\{Y_n\}$  是首项为 9 的等比数列，且

$$A \cdot 0$$

$$B \cdot 10$$

$$C \cdot 16$$

$$D \cdot 18$$

则  $\{Y_n\}$  的公比是

A. 2

B. 3

已知函数  $f(x)$  满足  $f\left(\frac{3\pi}{8}\right) = 2$ ，且  $f(x)$  的图象关于  $x = \frac{3\pi}{8}$  对称，则  $f(x)$  的解析式可能为

A.  $f(x) = 4\cos^2\left(\frac{x}{2} - 2\right) \sin x + \cos 2x + 2$

$$f(x) = \left(4\cos^2\frac{x}{2} - 2\right) \sin x + \cos 2x + 2 = 2\cos x \sin x + \cos 2x + 2 = \sin 2x + \cos 2x + 2$$

$$= \sqrt{2} \sin\left(2x + \frac{\pi}{4}\right) + 2$$

$$2x + \frac{\pi}{4} = k\pi \quad (k \in \mathbb{Z}) \Rightarrow x = \frac{k\pi}{2} - \frac{\pi}{8} \quad (k \in \mathbb{Z}) \Rightarrow k=1 \Rightarrow x = \frac{3\pi}{8}$$

则  $f(x)$  在  $\left(\frac{3\pi}{8}, 2\right)$  处取得极值

$$a_1 + a_9 = a_2 + a_8 = a_3 + a_7 = a_4 + a_6 = 2a_5$$

$$\{Y_n\} \text{ 是首项为 } 9 \text{ 的等比数列, } f(a_1) + f(a_2) + \dots + f(a_9) = 4 \times 4 + f(a_5) = 18$$

则  $\{Y_n\}$  的公比是

12. (2022·某某·某某) 已知  $C: \frac{x^2}{a^2} + \frac{y^2}{b^2} = 1 \quad (a > b > 0)$  的左焦点为  $F$ ，右焦点为  $B$ ，点  $C$  在  $BF$  上，点  $A$  在  $C$  上，且  $A \cdot x = 0$

已知  $A_1, O$  是  $BO = 2A_1A$  的中点，点  $C$  在  $BO$  上，且  $CO = \frac{1}{2}BO$

$$A \cdot \frac{\sqrt{3}}{3}$$

$$B \cdot \frac{1}{2}$$

$$C \cdot \frac{\sqrt{2}}{2}$$

$$D \cdot \frac{\sqrt{3}}{2}$$

则  $\{Y_n\}$  的公比是

A. 2

B. 3

C. 4

□□□□

$$\boxed{\boxed{BO=2AA}} \quad \boxed{\boxed{BF=2FA}} \quad \boxed{\quad}$$

□□□ A □□□ C:  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$  ( $a > b > 0$ ) □□

$$\frac{9}{4} \frac{c^2}{a^2} + \frac{b^2}{b^2} = 1 \implies \frac{c^2}{a^2} = \frac{1}{3}$$

$$e = \frac{c}{a} = \frac{\sqrt{3}}{3}$$

□□□A

13 2022. 12. 12. y[x] = x^2.1 3

[3.1] 3.  $f(x) = \lfloor \log_2 x \rfloor$   $f(1) = f(3) = f(5) = \dots = f(2^{10}-1)$

A 4097      B 4107      C 5119      D 5129

□□□□B

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$$2^j+1 \leq x \leq 2^{j+1}-1 \quad f(x)=i \quad i \in \mathbf{N}^* \quad [2^j+1, 2^{j+1}-1] \quad 2^{j-1}$$

$$f(1)=0 \quad f(3)=1$$

$$f(1) + (3) + f(5) + \dots + (2^{100} + 1) = 0 + 1 + 2 \times 2 + 3 \times 2^2 + \dots + 9 \times 2^8 + 10$$



$$f(x_1) + f(x_2) < \frac{x_2}{x_1} f(x_1) + \frac{x_1}{x_2} f(x_2)$$

$$2^x > 1 \quad g(2^x) < g(1) \quad \frac{f(2^x)}{2^x} < \frac{f(1)}{1} \Rightarrow f(2^x) < 2^x \quad (1)$$

$$x_1 + x_2 > x_1 \Rightarrow g(x_1 + x_2) < g(x_1) \Rightarrow \frac{x_1}{x_1 + x_2} f(x_1 + x_2) < f(x_1)$$

$$\frac{x_2}{x_1 + x_2} f(x_1 + x_2) < f(x_2) \quad f(x_1 + x_2) < f(x_1) + f(x_2) \quad (1)$$

$$f(x) = 1 \quad f(x_1 x_2) = f(x_1) f(x_2) = 1$$

①②③.

A

15. 2022. . . . .  $ABCD$  . . . . . 1 . . . . .  $AB = a$   $BC = b$   $AC = c$  . . . . .  $|a - b + c|$  . . . . .

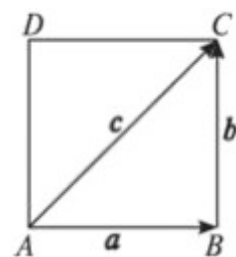
A 0

B  $\sqrt{2}$

C 2

D  $2\sqrt{2}$

C



$$a + b = c$$

$$\therefore |a-b+c| = |a-b+a+b| = |2a|$$

$$|a| = 1$$

$$\therefore |a-b+c| = |2a| = 2$$

选C.

选B

选B

16. 2021. 已知圆  $C_1: x^2 + y^2 = r^2$  与圆  $C_2: (x-a)^2 + (y-b)^2 = 4r^2 (r > 0)$  相切，则

A.  $(x_1, y_1)$  与  $(x_2, y_2)$  关于原点对称

$$A. x_1 + x_2 = a$$

$$B. y_1 + y_2 = 2b$$

$$C. 2ax_1 + 2by_1 = a^2 + b^2$$

$$D. a(x_1 - x_2) + b(y_1 - y_2) = 0$$

选D

选B

选B

选AB. 已知圆  $C_1$  与圆  $C_2$  相切，则 A. B. C. D. 选B.

选B

选AB. 已知圆  $C_1$  与圆  $C_2$  相切，则 A. B. C. D. 选C.

$$\begin{cases} 2ax + 2by = a^2 + b^2 - 3r^2 \\ y = \frac{b}{a}x \end{cases} \quad \text{选AB. 已知圆 } C_1 \text{ 与圆 } C_2 \text{ 相切，则 A. B. C. D. 选D.}$$

$$\begin{cases} 2ax_1 + 2by_1 = a^2 + b^2 - 3r^2 \\ 2ax_2 + 2by_2 = a^2 + b^2 - 3r^2 \end{cases} \quad \text{选D. 已知圆 } C_1 \text{ 与圆 } C_2 \text{ 相切，则 A. B. C. D. 选D.}$$

选D

选B

17. 2022. 已知数列  $\{a_n\}$  中  $a_1 = 4$ ,  $2\ln a_{n+1} = a_n - 1 (n \in \mathbb{N}^*)$  则下列结论中正确的是

- A.  $\ln a_n$  是等差数列  
B.  $\forall n \in \mathbb{N}^*, \ln a_{n+1} \geq \frac{1}{2} \ln a_n$   
C.  $a_n > 1$  且  $\forall n \in \mathbb{N}^*$   
D.  $a_1 \cdot a_2 \cdot a_3 \cdots a_9 > 4e$

【答案】BCD

【解析】

【分析】

由  $2\ln a_{n+1} = a_n - 1$  得  $(\ln a_2)^2 \neq \ln a_1 \cdot \ln a_3$ ，故 A 错误； $x - 1 \geq \ln x$ ，故  $\ln a_{n+1} \geq \frac{1}{2} \ln a_n$ ，故 B 正确； $a_n > 1$ ，故 C 正确；

故 D 正确。

【点评】

$$a_1 = 4, \ln a_2 = \frac{a_1 - 1}{2} = \frac{3}{2}, \ln a_3 = \frac{a_2 - 1}{2} = \frac{e^{\frac{3}{2}} - 1}{2} > 0$$

故  $(\ln a_2)^2 \neq \ln a_1 \cdot \ln a_3$ ，故 A 错误。

由  $x - 1 \geq \ln x$ ，故  $\ln a_{n+1} = \frac{a_n - 1}{2} \geq \frac{1}{2} \ln a_n$ ，故 B 正确。

由  $\ln a_{n+1} \geq \frac{1}{2} \ln a_n$ ，故 B 正确。

由 B 得  $\ln a_n \geq \left(\frac{1}{2}\right)^{n-1} \ln a_1 = \left(\frac{1}{2}\right)^{n-1} \ln 4 \Rightarrow a_n \geq 4^{\left(\frac{1}{2}\right)^{n-1}} > 1$ ，故 C 正确。

$$\ln(a_1 a_2 a_3 \cdots a_9) = \ln a_1 + \ln a_2 + \ln a_3 + \cdots + \ln a_9 > \left[1 + \left(\frac{1}{2}\right)^1 + \left(\frac{1}{2}\right)^2 + \cdots + \left(\frac{1}{2}\right)^8\right] \ln 4 = \left(2 - \frac{1}{2^8}\right) \ln 4$$

$$a_1 \cdot a_2 \cdot a_3 \cdots a_9 > 4^{2 - \frac{1}{2^8}} = 4 \times 4^{\frac{1}{2^8}} > 4 \times 4^{\frac{1}{4}} > 4e$$

【答案】BCD

18. 2022. 已知  $a, b$  满足  $aa + bb = 1$ ，则下列结论中正确的是

- A.  $a \geq 1$   
B.  $b \geq 1$

$$D\Box\left(\frac{n+1}{n}\right)^{\frac{n+1}{n}} > \left(\frac{n+2}{n+1}\right)^{\frac{n+2}{n+1}} (n \in \mathbb{N})$$

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$$\left(\frac{n+1}{n}\right)^{n+1} > \left(\frac{n+2}{n+1}\right)^{n+2} > \left(\frac{n+1}{n}\right)^n > \left(\frac{n+2}{n+1}\right)^{n+1}$$



□□□BCD

□□□□ACD

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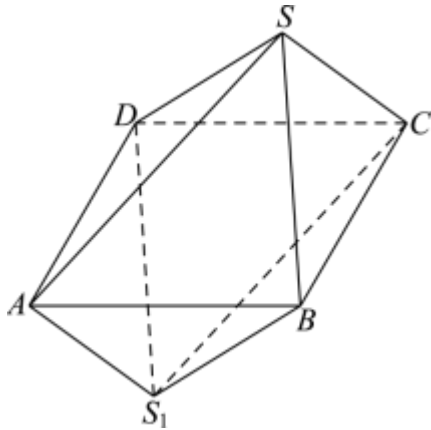
1111

$q < 0$   $a_n$   $a_{n+1}$   $C_n: a_n x^2 + a_{n+1} y^2 = 1$   $a_n x^2 + q a_n y^2 = 0$   $y = \pm \sqrt{-\frac{1}{q}} x$   $D$ .

ACD.

2022· $S-ABCD$   $S_1-ABCD$   $\Gamma$   $\triangle SAD$   $\triangle S_1BC$

$\alpha \parallel$   $SAD$   $\alpha$   $\Gamma$   $L$



A  $SB \perp BC$

B  $SC \perp AB$

C  $\Gamma$

D  $L$

BCD

$SB \perp SC$   $A$   $B$   $SA \perp SC$   $C$   $D$ .

$A$   $\triangle SAB \cong \triangle SDC$   $SA = SD$   $AB = DC$   $SB = SC$

$\triangle SBC$   $SB \perp SC$   $A$

$B$   $SA \perp AB$   $\triangle SAB$   $SA = AB$   $SA = AB = a$

$SB = \sqrt{SA^2 + AB^2} = \sqrt{2}a$   $SC = \sqrt{2}a$

$BC = AD = a$   $SB^2 + SC^2 > BC^2$   $\triangle SBC$

$SA \neq AB$

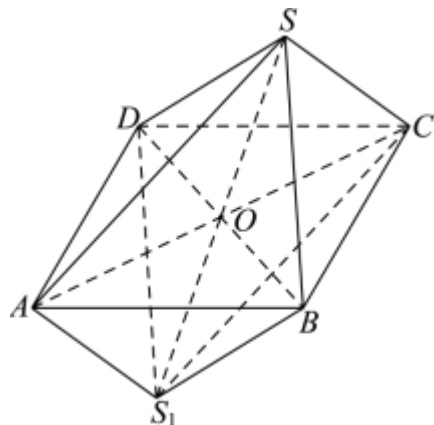
$SA = SB$   $SC = SB = AD = BC$   $\triangle SBC$

$SB = AB$   $\triangle SAB$   $AB \perp SB$

$\square AB \perp BC \square SB \cap BC = B \square AB \perp \square SBC \square$

$\square SC \subset \square SBC \square \therefore SC \perp AB \square B \square$

$\square C \square \square \square AC \square BD \square O \square OS \square OS \square$

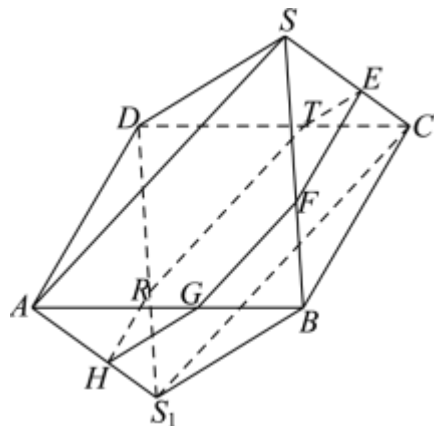


$\square SC \perp SB \square SC \perp AB \square SB \cap AB = B \square SC \perp \square SAB \square$

$Q SA \subset \square SAB \square SA \perp SC \square OS = OA = OB = OC = OD = \frac{1}{2} AC \square OS_1 = \frac{1}{2} AC \square$

$\square \square \square \square \Gamma \square \square \square \square C \square$

$\square D \square \square \square \square \alpha \square \square \square \square \Gamma \square \square \square \square \square \square \square \square$

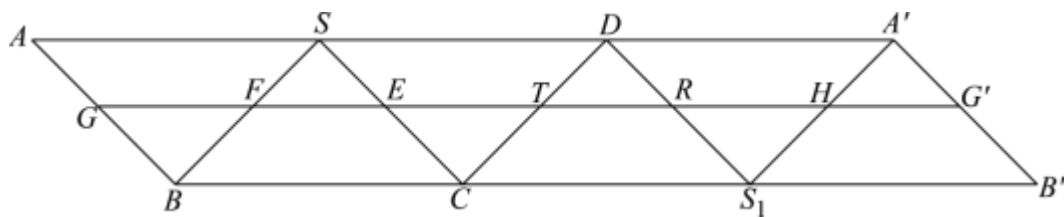


$\square \square \square \square \alpha \parallel \square SAD \square \square SAB \cap \square \alpha = GF \square \square SAD \cap \square SAB = SA \square GF \parallel SA \square$

$\square \square \square \square ET \parallel SD \square EF \parallel BC \square RH \parallel AD \square GH \parallel SB \square RT \parallel SC \square$

$\square \square SAD \square SBC \square SCD \square SAB \square SAD \square SCD \square \square \square \square \square \square \square \square \square \square \square \square \square \square$





□□□□□□□□  $ABBA$  □□□□□□□□  $AA = 3S4$  □

$$G \sqcup F \sqcup E \sqcup T \sqcup G \sqcup H \sqcup G \sqcup \dots \sqcup L = GG$$

□□  $GF//SA$  □□□  $GG//AA$  □□□□  $AG//AG$  □□□□□  $AA\overline{GG}$  □□□□□□□

$$\boxed{L=GG^*=AA^*=3S4}\boxed{\text{D}}\boxed{.}$$

□□□BCD.

1111

[illegible]

1

02

**03**

21 2022. 10. 10 “ ” .

$$P(X_1, Y_1) \cdot Q(X_2, Y_2) \cdot L_{PQ} = |X_1 - X_2| + |Y_1 - Y_2| \cdot P(-2, 1) \cdot Q \cdot M: (X-1)^2 + (Y-1)^2 = 1$$
$$\begin{array}{c} L_{PQ} \\ \square \quad \square \quad \square \quad \square \quad \square \quad \square \quad \square \end{array}$$

A□4

В□3

C□2

D□1

□□□□ABC

0000

1111

[illegible]

1111

$$M: (x-1)^2 + (y-1)^2 = 1$$

$$Q(1+\cos\theta, 1+\sin\theta), \theta \in [0, 2\pi)$$
$$L_{PQ} = |-2 - (1 + \cos \theta)| + |1 - (1 + \sin \theta)|$$




CC

$$f(-x) = \frac{\sin(-2x)}{(-x)^2 + \cos(-2x)} = \frac{-\sin 2x}{x^2 + \cos 2x} = -f(x) \quad \text{CC}$$

DD

$$f\left(\frac{\pi}{4}\right) = \frac{16}{\pi^2} \quad \text{DD}$$

BC

23. 2022. 已知函数  $f(x) = 4\ln x - kx - k + 8$  在  $x = 1$  处取得极大值，则  $k$  的取值范围是  $\square$

A. 1

B. e

C. 4

D.  $e^2$

CD

CC

CC

已知函数  $f(x)$  在  $x = 0$  处取得极大值，则  $f(x)$  在  $x = 0$  处取得极大值。

CC

已知函数  $f(x)$  在  $(0, +\infty)$  上取得极大值，则  $f(x) = \frac{4}{x} - k$  在  $x = 1$  处取得极大值。

当  $k \leq 0$  时， $f(x)$  在  $(0, +\infty)$  上取得极大值，则  $f(1) = 8 - 2k \geq 8$ ，则  $k \leq 0$ 。

当  $k > 0$  时， $0 < x < \frac{4}{k}$  时， $f(x) > 0$ ； $x > \frac{4}{k}$  时， $f(x) < 0$ 。则  $f(x)$  在  $(0, \frac{4}{k})$  上取得极大值，在  $(\frac{4}{k}, +\infty)$  上取得极小值。

当  $x = \frac{4}{k}$  时， $f(x)_{\max} = f(\frac{4}{k}) = 4\ln 4 + 4 - 4\ln k - k$ 。

当  $g(k) = 4\ln 4 + 4 - 4\ln k - k$  在  $k > 0$  时取得极大值，则  $g(k)$  在  $(0, +\infty)$  上取得极大值，则  $g(4) = 0$ 。

当  $\forall x \in (0, +\infty)$  时， $f(x) \leq 0$ ，则  $k > 0$  时， $f(x)_{\max} \leq 0$ ，则  $g(k) \leq 0 = g(4)$ 。

当  $k \geq 4$  时， $k$  的取值范围是  $[4, +\infty)$ 。

CD

CC





$$x = -1$$

$$y = \left| x + \frac{1}{x} + 3 \right|$$

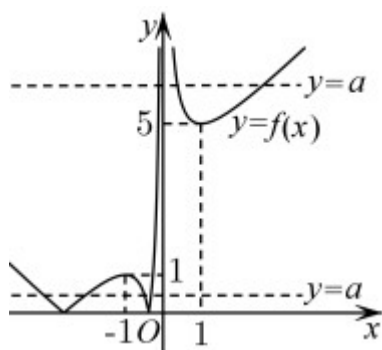
$$f(x) \quad a \in (-\infty, 0) \quad \text{A}$$

$$f(x) \quad a \in [0, 1) \cup (1, 5) \quad \text{B}$$

$$f(x) \quad a = 1 \quad a = 5 \quad \text{C}$$

$$f(x) \quad a \in (0, 1) \cup (5, +\infty) \quad \text{D}$$

AC.



$$C: \frac{x^2}{a^2} + \frac{y^2}{4} = 1 \quad (a > 2) \quad F_1, F_2 \quad A(2, \sqrt{3}) \quad C \quad M \quad C$$

$$A \quad a > 4$$

$$B \quad C \quad \left( 0, \frac{\sqrt{3}}{2} \right)$$

$$C \quad M \quad MF_1 \perp MF_2$$

$$D \quad |MF_1|^2 + |MF_2|^2 > 32$$

ACD

A C a A B M M

C D.



学科网



☐ A  $\frac{4}{a^2} + \frac{3}{4} < 1$   $a^2 > 16$   $a > 4$  ☐ A ☐

☐ B  $e = \frac{c}{a} = \sqrt{\frac{c^2}{a^2}} = \sqrt{\frac{a^2 - 4}{a^2}} = \sqrt{1 - \frac{4}{a^2}} \in \left(\frac{\sqrt{3}}{2}, 1\right)$  ☐ B ☐

☐ C  $F_1, F_2$   $C$   $F_1(-\sqrt{a^2 - 4}, 0)$   $F_2(\sqrt{a^2 - 4}, 0)$  ☐

$c = \sqrt{a^2 - 4}$   $M(x, y)$   $F_1M = (x + c, y)$   $F_2M = (x - c, y)$  ☐

$MF_1 \perp MF_2$   $F_1M \cdot F_2M = x^2 - c^2 + y^2 = 0$  ☐

$M$   $x^2 + y^2 = a^2 - 4$   $\begin{cases} x^2 + y^2 = a^2 - 4 \\ \frac{x^2}{a^2} + \frac{y^2}{4} = 1 \end{cases}$   $x^2 = \frac{a^2(a^2 - 8)}{a^2 - 4} > 0$  ☐

$x^2 + y^2 = a^2 - 4$   $C$  ☐  $C$  ☐

☐ D  $|MF_1|^2 + |MF_2|^2 = (x + c)^2 + (x - c)^2 + 2y^2 = 2x^2 + 2y^2 + 2c^2$

$= 2\left(a^2 - \frac{a^2 y^2}{4}\right) + 2y^2 + 2(a^2 - 4) = 4a^2 - 8 + \frac{(4 - a^2)y^2}{2} \geq 4a^2 - 8 + 2(4 - a^2) = 2a^2 > 32$  ☐ D ☐

☐ ACD.

26. 2022. 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100. 101. 102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 120. 121. 122. 123. 124. 125. 126. 127. 128. 129. 130. 131. 132. 133. 134. 135. 136. 137. 138. 139. 140. 141. 142. 143. 144. 145. 146. 147. 148. 149. 150. 151. 152. 153. 154. 155. 156. 157. 158. 159. 160. 161. 162. 163. 164. 165. 166. 167. 168. 169. 170. 171. 172. 173. 174. 175. 176. 177. 178. 179. 180. 181. 182. 183. 184. 185. 186. 187. 188. 189. 190. 191. 192. 193. 194. 195. 196. 197. 198. 199. 200. 201. 202. 203. 204. 205. 206. 207. 208. 209. 210. 211. 212. 213. 214. 215. 216. 217. 218. 219. 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1016. 1017. 1018. 1019. 1020. 1021. 1022. 1023. 1024. 1025. 1026. 1027. 1028. 1029. 1030. 1031. 1032. 1033. 1034. 1035. 1036. 1037. 1038. 1039. 1040. 1041. 1042. 1043. 1044. 1045. 1046. 1047. 1048. 1049. 1050. 1051. 1052. 1053. 1054. 1055. 1056. 1057. 1058. 1059. 1060. 1061. 1062. 1063. 1064. 1065. 1066. 1067. 1068. 1069. 1070. 1071. 1072. 1073. 1074. 1075. 1076. 1077. 1078. 1079. 1080. 1081. 1082. 1083. 1084. 1085. 1086. 1087. 1088. 1089. 1090. 1091. 1092. 1093. 1094. 1095. 1096. 1097. 1098. 1099. 1100. 1101. 1102. 1103. 1104. 1105. 1106. 1107. 1108. 1109. 1110. 1111. 1112. 1113. 1114. 1115. 1116. 1117. 1118. 1119. 1120. 1121. 1122. 1123. 1124. 1125. 1126. 1127. 1128. 1129. 1130. 1131. 1132. 1133. 1134. 1135. 1136. 1137. 1138. 1139. 1140. 1141. 1142. 1143. 1144. 1145. 1146. 1147. 1148. 1149. 1150. 1151. 1152. 1153. 1154. 1155. 1156. 1157. 1158. 1159. 1160. 1161. 1162. 1163. 1164. 1165. 1166. 1167. 1168. 1169. 1170. 1171. 1172. 1173. 1174. 1175. 1176. 1177. 1178. 1179. 1180. 1181. 1182. 1183. 1184. 1185. 1186. 1187. 1188. 1189. 1190. 1191. 1192. 1193. 1194. 1195. 1196. 1197. 1198. 1199. 1200. 1201. 1202. 1203. 1204. 1205. 1206. 1207. 1208. 1209. 1210. 1211. 1212. 1213. 1214. 1215. 1216. 1217. 1218. 1219. 1220. 1221. 1222. 1223. 1224. 1225. 1226. 1227. 1228. 1229. 1230. 1231. 1232. 1233. 1234. 1235. 1236. 1237. 1238. 1239. 1240. 1241. 1242. 1243. 1244. 1245. 1246. 1247. 1248. 1249. 1250. 1251. 1252. 1253. 1254. 1255. 1256. 1257. 1258. 1259. 1260. 1261. 1262. 1263. 1264. 1265. 1266. 1267. 1268. 1269. 1270. 1271. 1272. 1273. 1274. 1275. 1276. 1277. 1278. 1279. 1280. 1281. 1282. 1283. 1284. 1285. 1286. 1287. 1288. 1289. 1290. 1291. 1292. 1293. 1294. 1295. 1296. 1297. 1298. 1299. 1300. 1301. 1302. 1303. 1304. 1305. 1306. 1307. 1308. 1309. 1310. 1311. 1312. 1313. 1314. 1315. 1316. 1317. 1318. 1319. 1320. 1321. 1322. 1323. 1324. 1325. 1326. 1327. 1328. 1329. 1330. 1331. 1332. 1333. 1334. 1335. 1336. 1337. 1338. 1339. 1340. 1341. 1342. 1343. 1344. 1345. 1346. 1347. 1348. 1349. 1350. 1351. 1352. 1353. 1354. 1355. 1356. 1357. 1358. 1359. 1360. 1361. 1362. 1363. 1364. 1365. 1366. 1367. 1368. 1369. 1370. 1371. 1372. 1373. 1374. 1375. 1376. 1377. 1378. 1379. 1380. 1381. 1382. 1383. 1384. 1385. 1386. 1387. 1388. 1389. 1390. 1391. 1392. 1393. 1394. 1395. 1396. 1397. 1398. 1399. 1400. 1401. 1402. 1403. 1404. 1405. 1406. 1407. 1408. 1409. 1410. 1411. 1412. 1413. 1414. 1415. 1416. 1417. 1418. 1419. 1420. 1421. 1422. 1423. 1424. 1425. 1426. 1427. 1428. 1429. 1430. 1431. 1432. 1433. 1434. 1435. 1436. 1437. 1438. 1439. 1440. 1441. 1442. 1443. 1444. 1445. 1446. 1447. 1448. 1449. 1450. 1451. 1452. 1453. 1454. 1455. 1456. 1457. 1458. 1459. 1460. 1461. 1462. 1463. 1464. 1465. 1466. 1467. 1468. 1469. 1470. 1471. 1472. 1473. 1474. 1475. 1476. 1477. 1478. 1479. 1480. 1481. 1482. 1483. 1484. 1485. 1486. 1487. 1488. 1489. 1490. 1491. 1492. 1493. 1494. 1495. 1496. 1497. 1498. 1499. 1500. 1501. 1502. 1503. 1504. 1505. 1506. 1507. 1508. 1509. 1510. 1511. 1512. 1513. 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2012. 2013. 2014. 2015. 2016. 2017. 2018. 2019. 2020. 2021. 2022. 2023. 2024. 2025. 2026. 2027. 2028. 2029. 2030. 2031. 2032. 2033. 2034. 2035.

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$$P(A_i, B_j | i=1,2,3, j=1,2,3,4,5) = P(A_i)P(B_j) = \frac{1}{3} \cdot \frac{1}{2} \quad (i=1,2,3, j=1,2,3,4,5)$$

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$$A_i, B_j (i=1, 2, 3, j=1, 2, 3, 4, 5) \text{ are } R(A) = \frac{1}{3}, R(B_j) = \frac{1}{2} (i=1, 2, 3, j=1, 2, 3, 4, 5)$$

11

$$P(A_1A_2\overline{A_3}) + P(A_1\overline{A_2}A_3) + P(\overline{A_1}A_2A_3) + P(A_1A_2A_3) = 3 \times \left(\frac{1}{3}\right)^2 \times \frac{2}{3} + \left(\frac{1}{3}\right)^3 = \frac{7}{27}$$

11

$P(X=0) = P(\overline{A_1} \overline{A_2} \overline{A_3}) = \left(\frac{2}{3}\right)^3 = \frac{8}{27},$

$$P(X=1) = P(A_1 \overline{A_2} \overline{A_3}) + P(\overline{A_1} A_2 \overline{A_3}) + P(\overline{A_1} \overline{A_2} A_3) = 3 \times \frac{1}{3} \times \left(\frac{2}{3}\right)^2 = \frac{4}{9}$$
$$P(X=2) = P(A_1 A_2 \overline{A_3}) + P(A_1 \overline{A_2} A_3) + P(\overline{A_1} A_2 A_3) = 3 \times \left(\frac{1}{3}\right)^2 \times \frac{2}{3} = \frac{2}{9}$$
$$P(X=3) = P(A_1 A_2 A_3) = \left(\frac{1}{3}\right)^3 = \frac{1}{27} \quad \square$$
$$\square\square E(X) = 0 \times \frac{8}{27} + 1 \times \frac{4}{9} + 2 \times \frac{2}{9} + 3 \times \frac{1}{27} = 1 \square\square\square \text{ B } \square\square\square$$

□□ C□□□□□ 2 □□□□□□□□□□

$$P(BB\bar{B}_1\bar{B}_2) + P(\bar{B}B\bar{B}_1\bar{B}_2) + P(\bar{B}\bar{B}B_1\bar{B}_2) + P(B\bar{B}B_1\bar{B}_2)$$
$$+P(\overline{B}_1 B_2 B_3 B_4 B_5) + P(B_1 \overline{B}_2 B_3 B_4 B_5) = 6 \times \left(\frac{1}{2}\right)^5 = \frac{3}{16} \text{ } \square \square \square \text{ C } \square \square \square$$
[illegible]

□□□BCD



28. 2022. 已知函数  $f(x) = \begin{cases} 1 - |x+1|, & x < 0 \\ f(x-2), & x \geq 0 \end{cases}$

A.  $f(-4) + f(2021) = 0$

B.  $f(\log_3 6) < (\log_5 10) < f(\log_6 12)$

C. 若  $g(x) = f(x) - kx - 1$  有 3 个零点，则  $k \in \left(-\frac{1}{2}, -\frac{1}{4}\right)$

D. 若  $x \in \left(2k - \frac{3}{2}, 2k - \frac{1}{2}\right) (k \in \mathbb{N})$ ，则  $f(x) > \frac{1}{2}$

【答案】BCD

【解析】

【分析】

对于 A， $f(-4) = f(2021) = 0$ ，故 A 错误；对于 B， $f(x) = 1 - |x+1|$ ， $f(x) \in (-1, 0)$ ，故 B 正确；对于 C， $k \in \left(-\frac{1}{2}, -\frac{1}{4}\right)$ ，故 C 正确；

对于 D， $f(x) > \frac{1}{2}$ ， $x < 0$ ，故 D 正确。

【答案】

对于 A， $f(-4) = 1 - 3 = -2$ ， $f(2021) = (-1) = 1$ ， $f(-4) + f(2021) = -1$ ，故 A 错误。

对于 B， $x \leq -1$ ， $f(x) = 1 + x + 1 = x + 2$ ， $f(x) \in (-1, 0)$ ，故 B 正确。

对于 C， $-1 < x < 0$ ， $f(x) = 1 - (x+1) = -x$ ， $f(x) \in (-1, 0)$ ，故 C 正确。

对于 D， $1 < \log_3 6 < \log_3 9 = 2$ ， $1 < \log_5 10 < \log_5 25 = 2$ ， $1 < \log_6 12 < \log_6 36 = 2$ ，故 D 正确。

$\log_3 6 = \log_3 (3 \times 2) = \log_3 2 + 1$ ， $\log_5 10 = \log_5 (5 \times 2) = \log_5 2 + 1$ ，故 D 正确。

$\log_6 12 = \log_6 (6 \times 2) = \log_6 2 + 1$ ，故 D 正确。

对于 E， $\ln 6 > \ln 5 > \ln 3 > \ln 2 > 0$ ， $\frac{\ln 2}{\ln 3} > \frac{\ln 2}{\ln 5} > \frac{\ln 2}{\ln 6} > 0$ ，故 E 正确。

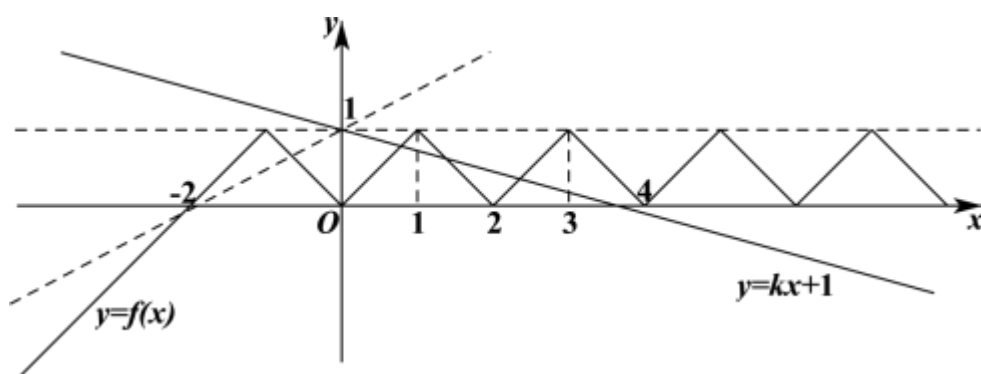
$\log_3 2 > \log_5 2 > \log_6 2$   $\log_3 6 - 2 > \log_5 10 - 2 > \log_6 12 - 2$

$\log_3 6 - 2 \in (-1, 0)$   $\log_5 10 - 2 \in (-1, 0)$   $\log_6 12 - 2 \in (-1, 0)$

$f(\log_3 6 - 2) < f(\log_5 10 - 2) < f(\log_6 12 - 2)$

$f(\log_3 6) < f(\log_5 10) < f(\log_6 12)$

$C$   $f(x)$   $y = kx + 1$



$k > 0$   $y = kx + 1$   $f(x)$

$k = 0$   $y = kx + 1$   $f(x)$

$y = kx + 1$   $f(x)$   $3$

$\begin{cases} 2k+1 > 0 \\ 4k+1 < 0 \end{cases}$   $-\frac{1}{2} < k < -\frac{1}{4}$   $C$

$D$   $x < 0$   $f(x) = 1 - |x+1| > \frac{1}{2}$   $|x+1| < \frac{1}{2}$   $-\frac{3}{2} < x < -\frac{1}{2}$

$x \geq 0$   $f(x) = f(x-2)$   $x \in \left(2k - \frac{3}{2}, 2k - \frac{1}{2}\right) (k \in \mathbb{N})$   $f(x) > \frac{1}{2}$   $D$

BCD.

29 2022 2  $ABCD - A_1B_1C_1D_1$   $BD_1$   $\alpha$   $AA_1$   $E$   $CC_1$   $F$



A  $\vec{BF} = \vec{ED_1}$

B  $\vec{EF} \perp \text{面 } DBB_1D_1$

C  $\text{面 } BFD_1E$  的面积是  $2\sqrt{6}$

D  $\alpha$  的余弦值是  $\frac{1}{3}$

已知正方体  $ABCD-A_1B_1C_1D_1$

棱长为 2

点  $E, F$  分别为  $BB_1, DD_1$  的中点

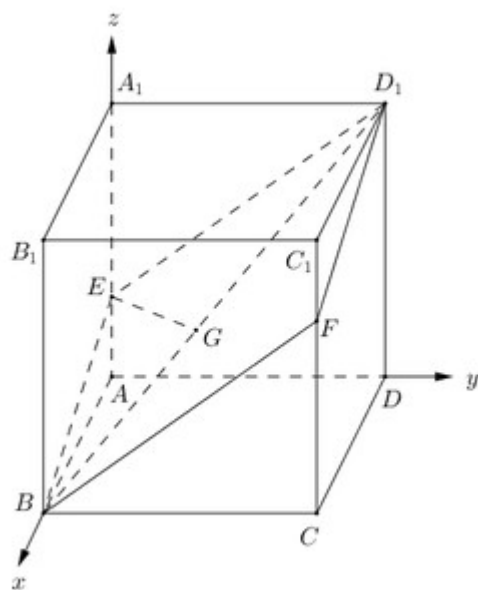
下列命题中，正确的是  $\vec{BF} = \vec{ED_1}$  ①  $\vec{EF} \perp \text{面 } DBB_1D_1$  ②  $\text{面 } BFD_1E$  的面积是  $2\sqrt{6}$  ③  $\alpha$  的余弦值是  $\frac{1}{3}$

①  $\vec{BF} = \vec{ED_1}$  ②  $\vec{EF} \perp \text{面 } DBB_1D_1$  ③  $\text{面 } BFD_1E$  的面积是  $2\sqrt{6}$  ④  $\alpha$  的余弦值是  $\frac{1}{3}$

正确的是

①②③④

①②③



建立空间直角坐标系  $A-xyz$

$A(0,0,0)$   $B(2,0,0)$   $C(2,2,0)$   $D(0,2,0)$   $A_1(0,0,2)$   $B_1(2,0,2)$   $C_1(2,2,2)$   $D_1(0,2,2)$

点  $E(0,0,1)$   $F(2,2,1)$   $\vec{BF} = (2,2,1)$   $\vec{ED_1} = (0,2,1)$

[illegible]

30/2022.  $f(x) = e^{kx} g(x)$   $\frac{\ln x}{k}$   $k \neq 0$

$$\mathbb{E} \left[ \int_0^T \int_{\mathbb{R}^d} |f(x) - g(x)|^2 dx dt \right] \leq \frac{\sqrt{2}}{e} \mathbb{E} \left[ \int_0^T \int_{\mathbb{R}^d} |A| dx dt \right]$$
$$C \leq k^{-1} \int_{\mathbb{R}^n} F(x) f(x) g(x) dx \leq \frac{5}{2}$$

□□□□ACD

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□□□□□□□□□□ A□

$$F(x) = f(x) - g(x)$$

$f(x)$      $g(x)$

1111

$$y = e^{kx} \Rightarrow \ln y = kx \Rightarrow x = \frac{\ln y}{k} \Rightarrow g(x) = \frac{\ln x}{k} \Rightarrow f(x) = e^{kx} \Rightarrow y = x^A$$
$$k=e^{\frac{1}{e}} \quad f(x)=e^{ex} \quad f'(x)=e \cdot e^{ex}=e \cdot e^{ex}=1 \cdot x=-\frac{1}{e} \quad f(-\frac{1}{e})=\frac{1}{e}$$
$$\text{Graph of } y=f(x) \text{ and } y=x \text{ intersect at } M\left(-\frac{1}{e}, \frac{1}{e}\right) \text{ and } M \text{ is the point where } x=y=0 \text{ and } d=\frac{\left|-\frac{1}{e}-\frac{1}{e}\right|}{\sqrt{2}}=\frac{\sqrt{2}}{e}$$
$$|AB|_{\min} = 2d = \frac{2\sqrt{2}}{e} \quad \square \text{B} \square$$
$$k=1 \quad F(x) = f(x) - g(x) = e^x - \ln x \quad F'(x) = e^x - \frac{1}{x} \quad F'(x) \quad \square \square \square \square$$



$$F\left(\frac{1}{2}\right) = \sqrt{e} - 2 < 0 \quad F(1) = e - 1 > 0 \quad F(x) \in \left(\frac{1}{2}, 1\right) \quad (0, +\infty) \quad x$$

$$F(x_0) = e^{x_0} - \frac{1}{x_0} = 0 \quad 0 < x < x_0 \quad F(x) < 0 \quad x > x_0 \quad F(x) > 0 \quad F(x) \in (0, x_0) \quad (x_0, +\infty)$$

$$F(x)_{\min} = F(x_0) = e^{x_0} - \ln x_0$$

$$e^{x_0} - \frac{1}{x_0} = 0 \quad x_0 = \ln \frac{1}{x_0} = -\ln x_0 \quad F(x)_{\min} = \frac{1}{x_0} + x_0$$

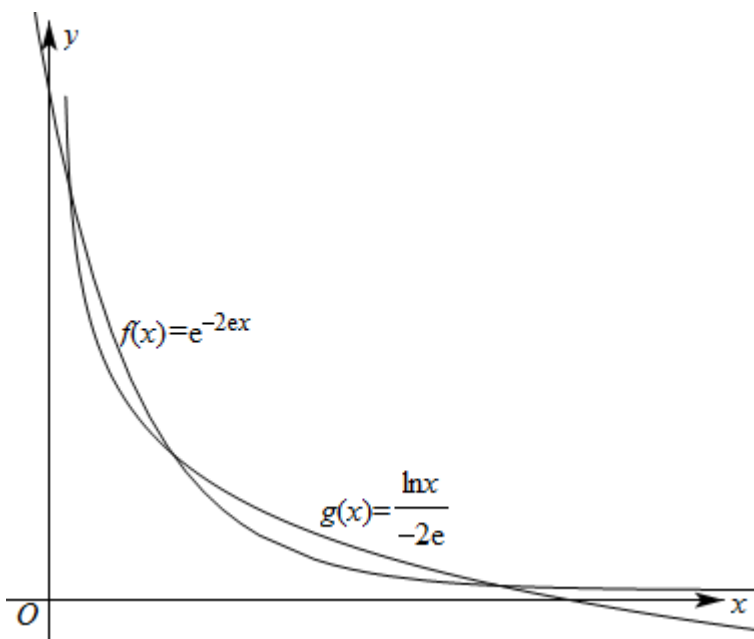
$$y = \frac{1}{x} + x \quad \left(\frac{1}{2}, 1\right) \quad x \in \left(\frac{1}{2}, 1\right)$$

$$F(x)_{\min} = \frac{1}{x_0} + x_0 < 2 + \frac{1}{2} = \frac{5}{2} \quad C$$

$$k = -2e \quad f(x) = e^{-2ex} \quad g(x) = \frac{\ln x}{-2e} \quad y = x$$

$$f(x) \quad x \quad g(x) \quad (1, 0) \quad x \quad x \quad (0, 1)$$

$$y = f(x) \quad y = g(x) \quad G(x) = f(x) - g(x) \quad 3 \quad 3$$



ACD



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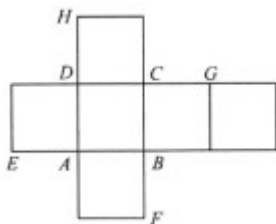
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$$f(x) - g(x)$$



□ □

31 2022. . . . .


$$A \square AE \parallel CD$$
 $B \parallel CH \parallel BE$  $C \sqcap DG \perp BH$ 
$$D \sqcap BG \perp DE$$

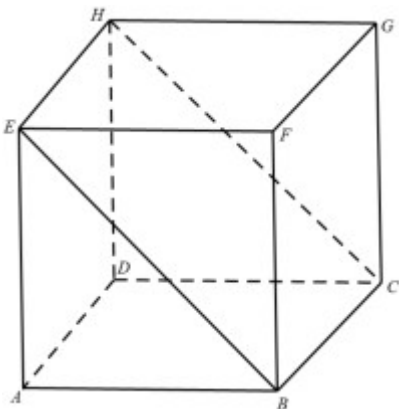
□□□□BCD

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[illegible]

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 $AE \perp CD$  □□A□□□

$HE \parallel BC, HE = BC$   $BCHE$   $CH \parallel BE$  **B**

$$\begin{array}{l} DG \perp HC, DG \perp BC, HC \cap BC = C, DG \perp BHC, DG \perp BH \\ \square \square, \square \square, \square \square, \square \square, \square \square \end{array}$$

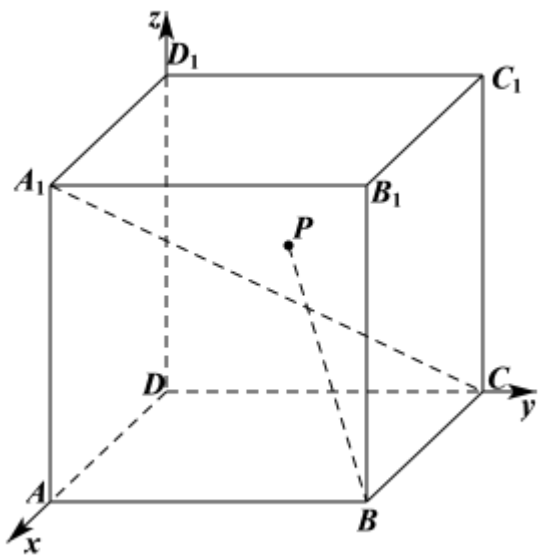
$BG \parallel AH$   $DE \perp AH$ ,  $BG \perp DE$  D  $\square$ .

32002021-00000000000000000000 $P$ 0000 $ABCD-$  $AB_1C_1D_1$ 0000 $CDD_1C_1$ 0000000000000000 $BP \perp AC$ 000000000010

$$\begin{array}{llll} \text{A} \square \frac{\sqrt{3}}{3} & \text{B} \square \frac{\sqrt{6}}{3} & \text{C} \square \frac{\sqrt{3}}{2} & \text{D} \square \frac{1}{2} \end{array}$$

10

□□  $D$  □□□□□□  $DA$  □  $DC$  □  $DD$  □□□□□□  $x$   $y$  □  $z$  □□□□□□□□□□  $P(0, y, z) (0 \leq y \leq 1, 0 \leq z \leq 1)$  □□□□□□□□□□

$$y = z_{\square\square\square\square\square\square\square\square\square\square\square} | PC | \square\square\square\square\square\square\square\square\square\square\square.$$
[illegible]
$$A(1,0,1) \quad C(0,1,0) \quad B(1,1,0) \quad P(0,y,z) \quad (0 \leq y \leq 1, 0 \leq z \leq 1)$$
$$AC = (-1, 1, -1) \quad BP = (-1, y-1, z)$$

$BP \perp AC$   $AC \cdot BP = 1 + y - 1 - z = y - z = 0$   $y = z$

$|PC| = \sqrt{(y-1)^2 + y^2} = \sqrt{2y^2 - 2y + 1} = \sqrt{2\left(y - \frac{1}{2}\right)^2 + \frac{1}{2}} \in \left[\frac{\sqrt{2}}{2}, 1\right]$

BC.

33 2022  $b > c > \frac{3}{2} > \frac{1}{3} < a < \frac{1}{2}$

A  $b \log_c a < c \log_b a$

B  $bc^a < cb^a$

C  $b^c > c^b$

D  $\log_b a < \log_c a$

AC

AD B C

A  $b > c > \frac{3}{2} > \frac{1}{3} < a < \frac{1}{2}$   $\log_c a < 0$   $\log_b a < 0$   $b^b > b^c > c^c > 1$

$\frac{b \log_c a}{c \log_b a} = \frac{b \lg a}{\lg c} \cdot \frac{\lg b}{\lg a} = \frac{\lg b}{\lg c} > 1$   $b \log_c a < c \log_b a$  A

B  $\frac{bc^a}{cb^a} = \frac{b}{c} \left(\frac{b}{c}\right)^{-a} = \left(\frac{b}{c}\right)^{1-a} > \left(\frac{b}{c}\right)^0 = 1$   $bc^a > cb^a$  B

C  $b^c > c^b$  C

D  $\frac{\log_b a}{\log_c a} = \frac{\lg a}{\lg b} \cdot \frac{\lg c}{\lg a} = \frac{\lg c}{\lg b} < 1$   $\log_b a > \log_c a$  D

AC.

34 2022  $f(x) = \begin{cases} 2^x - t, & x \geq 0, \\ -x^2 - 4x - t, & x < 0 \end{cases}$   $x_1, x_2, x_3$   $x_1, x_2, x_3$   $x_1 x_2 x_3$



\_\_\_\_\_.

$$\square\square\square\square [0,8)$$

$$\square\square\square\square$$

$$\square\square\square\square$$

$$\square g(x) = \begin{cases} 2^x, & x \geq 0, \\ -x^2 - 4x, & x < 0 \end{cases} \square\square\square\square\square\square y = g(x) \square\square\square\square\square\square y = t \square\square\square\square\square\square\square\square y = g(x) \square\square\square\square\square\square t \square\square\square\square\square\square\square\square$$

$$x_1 x_2 x_3 = \frac{t \ln t}{\ln 2} \square\square h(t) = \frac{d \ln t}{\ln 2} \square\square\square\square\square\square\square\square\square\square\square\square\square\square\square\square\square\square.$$

$$\square\square\square\square$$

$$\square g(x) = \begin{cases} 2^x, & x \geq 0, \\ -x^2 - 4x, & x < 0 \end{cases}$$

$$\square\square f(x) = \begin{cases} 2^x - t, & x \geq 0, \\ -x^2 - 4x - t, & x < 0 \end{cases} \square\square\square\square\square\square x_1 \square x_2 \square x_3 \square$$

$$\square y = g(x) \square\square\square\square\square\square y = t \square\square\square\square\square\square\square\square\square\square y = g(x) \square\square\square.$$

$$\square\square\square\square\square\square 1 \leq t < 4$$

$$\square x_1, x_2 \square -x^2 - 4x - t = 0 \square\square\square\square\square\square\square\square x_1 x_2 = t$$

$$x_3 \square\square 2^{x_1} - t = 0 \square\square x_3 = \log_2 t$$

$$\square\square x_1 x_2 x_3 = t \log_2 t = \frac{d \ln t}{\ln 2}$$

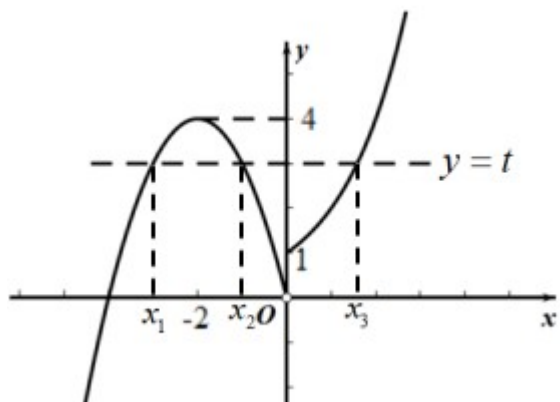
$$\square h(t) = \frac{d \ln t}{\ln 2} \square\square h'(t) = \frac{1}{\ln 2} (1 + \ln t)$$

$$\square 1 \leq t < 4 \square\square h'(t) = \frac{1}{\ln 2} (1 + \ln t) > 0$$

$$h(t) = \frac{\ln t}{\ln 2} \quad [1, 4]$$

$$h(t) \in [0, 8)$$

$$[0, 8)$$



35 2022· 函数  $f(x) = \cos 2x + a \cos x$  在  $\left(0, \frac{\pi}{3}\right)$  上恒成立  $a$  的取值范围是\_\_\_\_\_.

$$a \geq -2$$

$$a \geq -2$$

$$a \geq -2$$

$$f(x) \leq 0 \quad \left(0, \frac{\pi}{3}\right) \quad a \leq -4 \cos x \quad \left(0, \frac{\pi}{3}\right)$$

$$a \leq -4 \cos x$$

$$f(x) = \cos 2x + a \cos x$$

$$f'(x) = -2 \sin 2x - a \sin x = -4 \sin x \cos x - a \sin x$$

$$\therefore f(x) = \cos 2x + a \cos x \quad \left(0, \frac{\pi}{3}\right)$$

$$\therefore f(x) \leq 0 \quad \sin x > 0$$

$$\therefore -4 \sin x \cos x - a \sin x \leq 0 \quad a \geq -4 \cos x \quad \left(0, \frac{\pi}{3}\right)$$



$$\frac{3\sqrt{2}}{16}$$

37 2022· 数列· 数列通项公式  $a_n$  1 1 2 3 5 8 ... 数列通项公式 ... (Leonardo

Fibonacci) 数列通项公式 “数列” 数列通项公式  $a_1 = a_2 = 1$   $a_{n+2} = a_{n+1} + a_n$  ( $n \in \mathbb{N}^*$ ) 数列通项公式

$$60 \text{ 数列通项公式 } a_n = \frac{1}{\sqrt{5}} \left[ \left( \frac{1+\sqrt{5}}{2} \right)^n - \left( \frac{1-\sqrt{5}}{2} \right)^n \right] \text{ 数列通项公式}$$

$$a_{n+1}^2 = a_{n+1} (a_{n+2} - a_n) = a_{n+2} a_{n+1} - a_{n+1} a_n \text{ 数列通项公式 } a_1^2 \text{ 数列通项公式 } a_2^2 \text{ 数列通项公式 } a_3^2 \text{ 数列通项公式 } \dots \text{ 数列通项公式 } a_{126}^2 \text{ 数列通项公式}$$

4

数列

数列

$$a_{n+1}^2 = a_{n+1} (a_{n+2} - a_n) = a_{n+2} a_{n+1} - a_{n+1} a_n \text{ 数列通项公式 } 60 \text{ 数列通项公式}.$$

数列

$$a_{n+1}^2 = a_{n+1} (a_{n+2} - a_n) = a_{n+2} a_{n+1} - a_{n+1} a_n \text{ 数列通项公式 } a_1^2 + (a_2 a_3 - a_2 a_1) + (a_3 a_4 - a_3 a_2) + \dots + (a_{126} a_{127} - a_{126} a_{125})$$

$$= 1 - a_2 a_4 + a_{126} a_{127} = a_{126} a_{127}$$

$$60 \text{ 数列通项公式 } a_{126}, a_{127} \text{ 数列通项公式 } a_6 = 8, a_7 = a_6 + a_5 = 13 \text{ 数列通项公式 } 8 \times 3 = 24 \text{ 数列通项公式}$$

$$a_{126} a_{127} \text{ 数列通项公式 } 4.$$

4.

38 2022· 数列· 数列通项公式  $xOy$  平面直角坐标系  $kx^2 + y + 2k = 0$   $x^2 + ky^2 = 2$  ( $k \in \mathbb{R}$ ) 平面  $P$  平面  $C$  平面  $I$

$$C \text{ 平面 } M \text{ 平面 } N \text{ 平面 } OM \cdot ON \text{ 平面 } O \text{ 平面 } I \text{ 平面}$$





1111

$P \subset C \cap C \cap O \cap I$ .

0000

$$\square_{X \neq 0} \square \square \square k_{X-} \square_{Y=0} \square \square k = \frac{Y}{X} \square \square \square X + k_{Y-} \square = 0 \square \square \square X + \frac{Y^2}{X} - 2 = 0 \square$$

$$x^2 + y^2 - 2x = 0 \quad (0,0) \quad x^2 + y^2 - 2x = 0 \quad x \neq 0$$

$$y = nK + n \quad x^2 + y^2 - 2x = 0$$

$$(m^2 + 1)x^2 + (2mn - 2)x + n^2 = 0 \quad M(x_1, y_1), M(x_2, y_2)$$

$$\Delta = (2mn - 2)^2 - 4(m^2 + 1)n^2 > 0 \Rightarrow n^2 + 2mn < 1$$

$$\boxed{X_1 + X_2 = \frac{2 - 2mn}{m^2 + 1}, X_1 X_2 = \frac{n^2}{m^2 + 1}} \quad \boxed{\phantom{00}}$$

$$OM \cdot ON = x_1 x_2 + y_1 y_2 = (m^2 + 1)x_1 x_2 + mn(x_1 + x_2) + n^2 = 1$$

$$m(m+1) \cdot \frac{n^2}{m^2+1} + mn \cdot \frac{2-2mn}{m^2+1} + n^2 = 1 \quad 2mn+2n^2=m^2+1$$

$$O(1) d^2 = \frac{n^2}{m^2 + 1} = \frac{n^2}{2nm + 2n^2}$$

$$d^2 = \frac{1}{2 \left( \frac{m}{n} + 1 \right)}$$

$$\frac{m}{n} = t \begin{cases} n(1+2t) < 1 \\ n^2(2+2t-t^2) = 1 \end{cases} \begin{cases} 1+2t < 2+2t-t^2 \\ 2+2t-t^2 > 0 \end{cases}$$

$$\boxed{1-\sqrt{3}} < t < 1 \implies \frac{1}{4} < d^2 < \frac{1}{2(2-\sqrt{3})} = \frac{2+\sqrt{3}}{2} \quad \square$$

$$\square\square\square\square\square\left(\frac{1}{4},\frac{2+\sqrt{3}}{2}\right).$$

0000

39 2022. 10. 10. P-  $ABC$  中  $PA \perp$  平面  $ABC$ ,  $AC \perp CB$ ,  $PA = AC = BC = 4$ , 求  $A$  到  $BC$  的距离.

367 PBC

 $\square\square\square\square\pi$ 

0000

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[illegible]

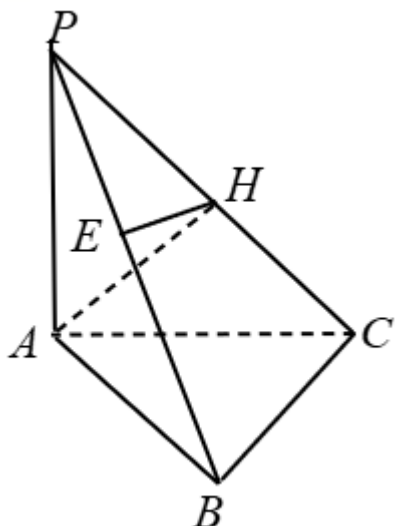
1111

$R = 47$   $R^2 = 36.7$   $R = 3$

$$\square \square \square PC \square \square H \square \square PA = AC \square \therefore AH \perp PC$$
$$\boxed{PA \perp \boxed{ABC}} \quad BC \subset \boxed{ABC} \therefore PA \perp BC$$
$$\boxed{AC \perp CB} \quad \boxed{AC \cap PA = A} \quad \boxed{BC \perp \boxed{PAC}}$$
$$\boxed{AH \subset \boxed{PAC}} \therefore BC \perp AH \quad \boxed{BC \cap PC = C} \therefore AH \perp \boxed{PBC}$$
$$PA=AC=BC=4 \therefore AH=2\sqrt{2} \quad PB=4\sqrt{3}$$
$$\boxed{r = \sqrt{3^2 - (2\sqrt{2})^2} = 1} \boxed{}$$
$$\square HE \perp PB \square \vee PEH: \vee PCB \square \cdot \frac{EH}{CB} = \frac{PH}{PB} \square$$
$$\therefore EH = \frac{PH \cdot CB}{PB} = \frac{2\sqrt{2} \times 4}{4\sqrt{3}} = \frac{2\sqrt{6}}{3} > 1$$

$\square\square\square\square\square\square PBC \square\square\square\square H \square\square\square\square\square\square 1 \square\square\square\square\square\square\square\square \pi\times 1=\pi$

 $\square\square\square\square\square\pi$ 



40 2022· ·  $f(x) = x(e^x + 1)$   $g(x) = (x+1) \ln x$   $f(x_1) = g(x_2) = m (m > 1)$   $\frac{x_1 + x_2}{\ln m}$

\_\_\_\_\_

e

$x_1 = \ln x_2$   $h(x) = \frac{x}{\ln x}$   $x > 1$

$g(x) = (x+1) \ln x = (e^{\ln x} + 1) \ln x = f(\ln x)$   $f(x_1) = f(\ln x_2) = m (m > 1)$   $f(x_1) = x_1(e^{x_1} + 1) > 1$   $x_1 > 0$

$x > 0$   $f'(x) = (x+1)e^x + 1 > 0$   $f(x) = x(e^x + 1)$   $x_1 = \ln x_2$   $\frac{x_1 + x_2}{\ln m} = \frac{m}{\ln m}$   $h(x) = \frac{x}{\ln x}$

$h(x) = \frac{\ln x - 1}{(\ln x)^2}$   $x \in (1, e)$   $h'(x) < 0$   $x \in (e, +\infty)$   $h'(x) > 0$   $h(x)$   $x = e$

$h(e) = \frac{e}{\ln e} = e$   $\frac{x_1 + x_2}{\ln m} = e$

e

41 2022· ·  $C: \frac{x^2}{a^2} + \frac{y^2}{b^2} = 1 (a > b > 0)$   $C: x^2 - 2py (p > 0)$   $F$   $P$   $C$   $C$







1111

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$$g(x) = \cosh x = \frac{e^x + e^{-x}}{2} \quad g'(x) = \frac{e^x - e^{-x}}{2} \quad g''(x) = \frac{e^x + e^{-x}}{2}$$

$$I_2 y = \frac{e^n + e^m}{2} (x - m) + \frac{1}{2} (e^n - e^m) P(m+1, e^n)$$

$$\square\square AB \cdot AP = \frac{1}{2}(e^{2m} - 1) \square BA \cdot BP = \frac{1}{2}(e^{2m} + 1) \square PA \cdot PB = 1 + \frac{1}{4}(e^{2m} - e^{2m}) \square$$

$$\Box \Box \angle A \Box \exists B \Box \Box \Box \Box \Box \Box \angle F \Box \Box \Box.$$













图2

[illegible]

$$\square\square\square\square \quad 2\sqrt{3} \quad 6\sqrt{2}$$

1111

□□□□

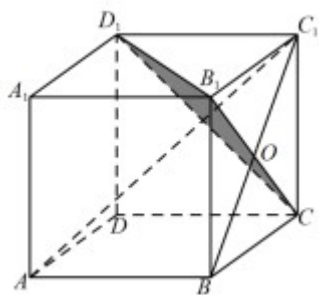
$E, F, G, H, M$   $\alpha$   $EFGHMN$

0000

$$\square\square\square\square\square\square\square\square AB\perp B_1BCC_1 \quad \square\square\square\square\square\square\square\square AB\perp B_1C \quad \square\square\square\square\square\square\square\square BC\perp B_1C \quad \square\square\square\square\square\square\square\square AB\cap BC=E \quad \square\square\square\square\square\square\square\square B_1C\perp ABC_1 \quad \square\square\square\square\square\square\square\square B_1C\perp AC_1$$

$$AC_1 \perp D_1B_1 \quad \square \square \square \square \square \square \square \square \quad AC_1 \perp \square \square \quad B_1CD_1 \quad \square \square \square \square \quad \alpha \quad \square \square \square \square \square \square \square \square \square \square \quad B_1CD_1 \quad \square \square \quad B_1C = CD_1 = B_1D_1 = 2\sqrt{2} \quad \square \square \square$$

$$S_{\triangle B_1CD_1} = \frac{1}{2} \times 2\sqrt{2} \times 2\sqrt{2} \times \sin 60^\circ = 2\sqrt{3}.$$



$BC, DC, DD_1, AD_1, AB_1$   $E, F, G, H, M$   $EF, GF, HG, HM, MN, NE, HE$   $FE, AB, MN$

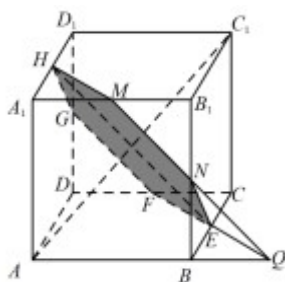
$FE, AB, MN$   $Q$   $MN \parallel HE, HE \parallel GF$   $H, E, N, M$   $G, F, E, H$   $HENM \cap$

$GFEH = HE$   $Q \in$   $HENM$   $Q \in$   $GFEH$   $E, F, G$   $, H, M, N$   $HM \perp AC_1, NE \perp AC_1$

$AC_1 \perp$   $EFGHNM$   $\alpha$   $EFGHNM$

$EF = GF = HG = HM = NE = NM = \sqrt[3]{2}$   $\alpha$

$2\sqrt{3}$   $6\sqrt{2}$



46 2022  $\triangle ABC$   $a, b, c$   $a, b, c$   $V_a, V_b, V_c$

$V_a = \frac{1}{4}, V_b = \frac{1}{3}, V_c = \frac{1}{2}$   $\cos A$   $\angle BAC = \frac{\pi}{6}$   $V_b V_c = 1$   $V_b^2 + V_c^2 - \frac{1}{V_a^2}$

$-\frac{1}{4}$   $\sqrt{3}$

$a, b, c$   $h_a, h_b, h_c$   $S$   $V_a = \frac{1}{4}, V_b = \frac{1}{3}, V_c = \frac{1}{2}$

$a, b, c$   $\cos A$   $a V_a = b V_b = c V_c$





□ 0 □□ 1 □□□□ 1□

$$1 \ 2 \ \dots \ C_1^0 \ C_1^1,$$
$$x_2^2 x_3^3 = C_2^0 C_2^1 C_2^2,$$

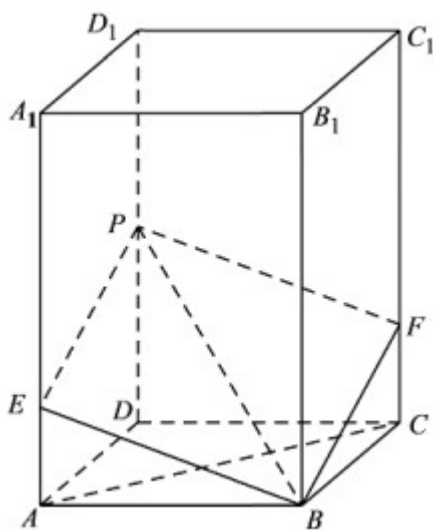
.....

${}^9P_4 = \frac{9 \times 8 \times 7 \times 6}{4 \times 3 \times 2 \times 1} = 126$

**9**  $C_9^0 + C_9^2 + C_9^4 + \cdots + C_9^8 = 2^{9-1} = 256.$

□□□□126□256.

48□□2022·□□□□·□□□□□□□□□□ $\square ABCD-AB_1C_1D_1$ □□ $AB=AD=2, AA_1=4 \square P \square DD_1$ □□□□□ $PB$ □□□ $\alpha$

$$A A_1, C C_1 \cap EF \cap AC // \alpha \quad \text{_____} \quad PEBF \quad \text{_____}$$


$\square\square\square\square$   $3$   $2\sqrt{6}$

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$\square \square \square \square \square B \overset{AC}{\square \square \square \square \square} DA, DC \square \square \square \square \square G \square H \square \square PG, PH \square \square \square \square AA_1, CC_1 \square \square E \square F \square \square \square \square PGH \square \square$

$$\alpha \quad \square\square\square\square\square\square\square V_{\square}\square\square\square\square\square - \frac{V_{\square}}{V_{\square}}\square$$

□□□□□□□□ *PEBF* □□□□□□□□□□□□□□□□.

0000

□□□□  $B$  □□□□□□  $AC$  □□□□□□  $DA, DC$  □□□□□  $G$  □□□□  $H$  □□□□  $PG, PH$  □□□□  $AA_1, CC_1$  □□  $E, F$

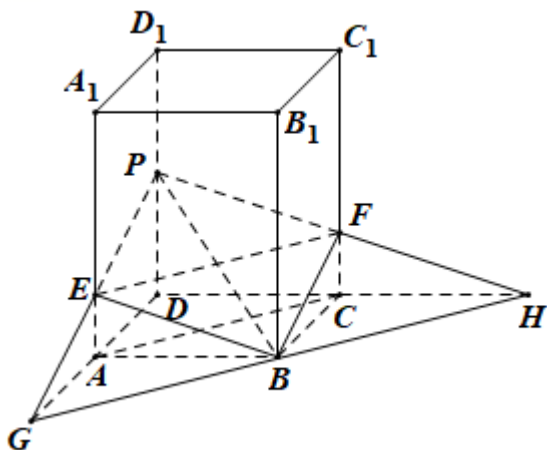
$$\square\square AC \parallel \textcolor{red}{GH} \quad \square\square AC \not\subset \square\square PGH \quad \textcolor{red}{GH} \subset \square\square PGH$$
 $\square\square AC // \square\square PGH \square$ 
$$\boxed{\boxed{\boxed{\boxed{PGH}}}\alpha}$$
$$AB=AD=2, AA_1=4, AE=1$$

$$\square\square V_{\square}=2 V_{B-ADPE}=2 \times \frac{1}{3} \times \frac{(1+2) \times 2}{2} \times 2=4, \frac{V_{\square}}{V_{\square}}=\frac{2 \times 2 \times 4-4}{4}=3 \square$$

□□□□ $PEBF$ □□□□ $EF=2\sqrt[4]{2}, PB=2\sqrt[4]{3}$ □

$$\square\square S_{PEBF} = \frac{1}{2} EF \times PB = 2\sqrt{6}\square$$

□□□□□3□<sup>2√6</sup>.

[illegible]
$$r_1 \square r_2 \square \square \square \square \square \square O_1 \square O_2. \square \square \square \square ABCD \square \square \square \square 1 \square \square \frac{r_2}{r_1} = \textcolor{red}{i} \square \square \square \square \square O_1 O_2 \square \square \square \square.$$
[illegible]

$$2 - \sqrt[3]{3} - \sqrt[3]{3} + 2 \quad 2 - \sqrt[3]{3} - \sqrt[3]{3} + 2$$

□□□□

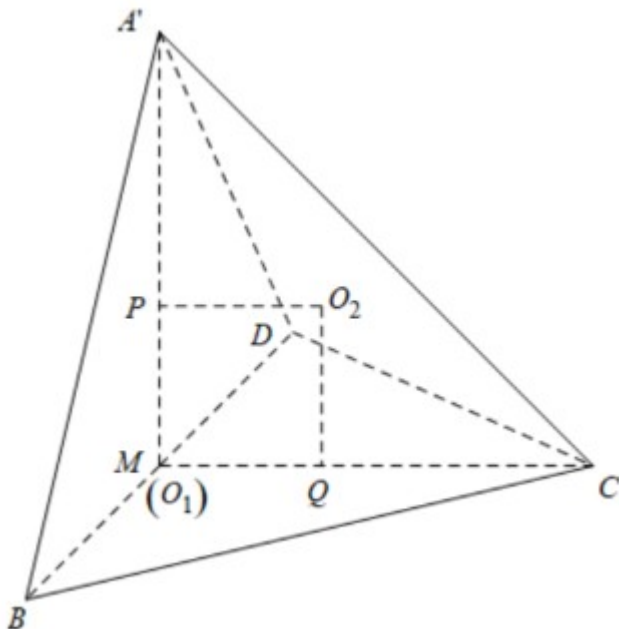
□□□□

$$r_1 = \frac{\sqrt[3]{2}}{2} \quad r_2 = \frac{2\sqrt[3]{2} - \sqrt[3]{6}}{2}$$

□□□□

$$AC \cap BD = M \quad MA = MB = MC = MD = \frac{1}{2} BD = \frac{\sqrt[3]{2}}{2}$$

$$\therefore r_1 = \frac{\sqrt[3]{2}}{2} \quad M \quad O_1$$



$$\because ABCD \text{ 是菱形 } BD \perp AC \quad A'M \perp BD$$

$$\therefore A'M \perp \text{平面 } BCD \quad MC \subset \text{平面 } BCD$$

$$\therefore A'M \perp MC \quad A'C = 1$$

$$\therefore S_{\triangle A'BD} = S_{\triangle CBD} = \frac{1}{2} S_{\triangle A'BC} = S_{\triangle A'CD} = \frac{\sqrt[3]{3}}{4}$$

$$\therefore \frac{1}{3} \left( \frac{1}{2} + \frac{1}{2} + \frac{\sqrt[3]{3}}{4} + \frac{\sqrt[3]{3}}{4} \right) r_2 = \frac{1}{3} \times \frac{1}{2} \times \frac{\sqrt[3]{2}}{2} \quad r_2 = \frac{2\sqrt[3]{2} - \sqrt[3]{6}}{2}$$

$$\therefore \frac{r_2}{r_1} = \frac{\frac{2\sqrt[3]{2} - \sqrt[3]{6}}{2}}{\frac{\sqrt[3]{2}}{2}} = 2 - \sqrt[3]{3}$$



以  $O_2$  为圆心  $A'B$  为弦作圆  $BCD$  交  $PA$  于  $Q$  交  $O_2P$  于  $M$  交  $PM$  于  $Q$

$$\therefore O_2M = O_2O_1 = \sqrt{2}r_2 = 2 - \sqrt{3}.$$

$$2 - \sqrt{3} = 2 - \sqrt{3}.$$

50. 2022. 1. 1. 某几何体的三视图如图，该几何体的体积为  $4\text{ cm}^3$ ，求该几何体的表面积  $S$ 。

该几何体的底面边长为  $\underline{\hspace{2cm}}\text{ cm}$ ，高为  $\underline{\hspace{2cm}}\text{ cm}$ 。

$$\text{底面边长} = 8, \quad \frac{4\sqrt{3}}{3}$$

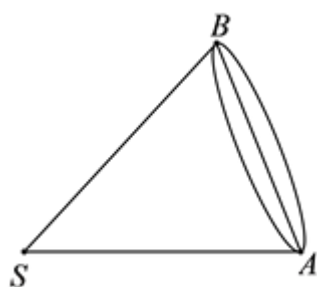
表面积

表面积

$$\text{表面积} = \frac{1}{2} \pi l^2 = 8\pi l$$

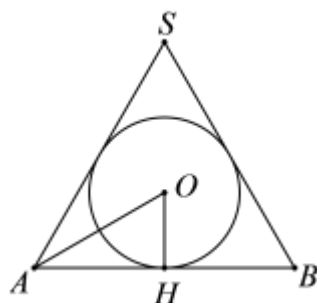
表面积

$$\text{表面积} = \frac{1}{2} \pi l^2 = 8\pi l$$



$$S = \pi r l = 4\pi l.$$

$$2 \times \pi l^2 = 2 \times 4\pi l \Rightarrow l = 8\text{ cm}.$$



$$\therefore \text{底面半径} R = OH = \frac{\sqrt{3}}{6} AB = \frac{4\sqrt{3}}{3}\text{ cm}$$







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